SONY

White paper

April 2016

Xperia™ Z3

D6603/D6633/D6643/D6653/D6616

Note: Screen images are simulated.

Purpose of this document

Sony product White papers are intended to give an overview of a product and provide details in relevant areas of technology.

Document history

Version		
September 2014	First released version	Version 1
January 2015	Second released version	Version 2
February 2015	Third released version	Version 3
April 2015	Fourth released version	Version 4
May 2015	Fifth released version	Version 5
June 2015	Sixth released version	Version 6
August 2015	Seventh released version	Version 7
April 2016	Eighth released version	Version 8

Sony Mobile Developer World

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This White paper is published by:

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First released version (September 2014)

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Product overview

Highlights

- 20.7 MP camera with 4K video: high quality images & videos
- High dust tight and water resistance rating – IP65 and IP68
- Long-lasting battery
- Ultra fast performance: Snapdragon 801 Quad-Core 2.5 Ghz processor and 3 GB of RAM

Only the best

The Xperia™ Z3 blends design and engineering craftsmanship to deliver beauty. It's super-slim rounded aluminium frame, uniquely designed power button and durable tempered glass panels, give it an elegantly premium finish. Plus, with an easy-to-use interface and symmetrical design, it feels right at home in your hand.

The Xperia™ Z3's Snapdragon 801 processor offers speeds up to 2.5 Ghz for lightning-fast web-browsing, super-fluid interactions and impressive multi-tasking, all while maintaining optimum battery power. So whether you want to listen to your favourite albums online, download important documents, or lose yourself in the latest movies, the Xperia™ Z3 pushes the capabilities of power to give you an impressive battery life.

All the latest camera technology from Sony

The Xperia™ Z3 features a unique combination of Sony Cyber-shot™ and Handycam® technologies to help you capture the moments that matter most, in the highest quality. Good is capturing the moment. Great is enhancing it with low-light capability and ISO 12800 sensitivity in a smartphone.

The Xperia™ Z3's 2.3-inch ExmorRS™ for mobile sensor and BIONZ™ for mobile processing engine work together to capture every striking detail – for photos and videos with less noise, better exposure and vivid colours, even in lowlight. And you can fit even more into every shot with the new 25 mm wide-angle Sony G Lens, so you never miss out on all the action.

You can pause and resume filming, in super-clear 4K resolution. Plus, Sony's new and improved SteadyShot™ technology helps you shoot videos that are seamlessly smooth and stable.

Unrivalled entertainment

Sony is continuously developing the best sound technology for crystal clear listening and astounding acoustic performance.

Good is having all your music in one place. Great is making your favourite tunes sound even better. Our digital amp technology, uniquely developed for High-Res audio, reduces distortion and noise at wider frequency ranges, to reproduce high frequency sound in amazing detail. Plus, you can immerse yourself in superior audio and upscale your low-resolution music to enjoy it in better quality with DSEE HX. And with Sony's Digital Noise Cancelling technology, exterior noise can be reduced when paired with a DNC headset.

Sony's online services make finding your next favourite album easy. Choose from our vast library of millions of songs with Music Unlimited and lose yourself in the soundtrack to your life.

From breathtaking colour, to pixel-perfect resolution, Sony knows it's the details that make the difference. Whether you watch the latest movies, browse the web or view pictures on the go, Sony's TRILUMINOS™ Display technology, X-Reality™ for mobile and ultra-bright displays mean you are guaranteed the best picture quality, wherever you are.

Facts – dimensions, weight, performance and networks

Operating system	Google™ Android™ 6 (Marshmallow)
Processor	2.5 GHz Qualcomm Snapdragon 801 MSM8974AC Quad-Core
GPU	Adreno 330
Size	146 x 72 x 7.3 mm
Weight	152 grams
Available colours	D6603/D6653 Black, White, Copper and Silver Green
	D6633 Black, White, Copper
	D6616/D6646 Black
	D6643 Black, White
SIM card	D6603/D6643/D6653/D6616/D6646 nano SIM
	D6633 Dual SIM: 2 nano SIM card slots
Main screen	
Colours	16,777,216 colour TFT
Resolution	Full HD 1920x1080 pixels
Size (diagonal)	5.2 inches
Input mechanisms	
Text input	On-screen QWERTY keyboard
Touch screen	Capacitive
Touch gesture	Yes – multi-touch, up to 10 fingers supported
Memory	
RAM	3 GB
Flash memory	D6603/D6643/D6653/D6633 Up to 16 GB*
	D6616/D6646 Up to 32 GB*
Expansion slot	microSD™ card, up to 128 GB (SDXC supported)

Camera	
Camera resolution	20.7 MP
Digital zoom	8x
Clear image zoom	3x
Photo light	Yes – Pulsed LED
Video recording	Yes – 4K
Front Camera	Yes – HD 1080p for video chat and 2.2 MP for camera capture
ISO	ISO 3200 maximum in manual mode
	ISO 12800 maximum in Low Light mode for photo
	ISO 2000 maximum in Night scene mode for video
Minimum focus distance	120 mm
Sensors	
Accelerometer	Yes
Ambient light sensor	Yes
Barometer sensor	Yes
Game rotation vector	Yes
Geomagnetic rotation vector	Yes
Gyroscope	Yes
Magnetometer	Yes
Step counter	Yes
Step detector	Yes
Significant motion detector	Yes
Proximity sensor	Yes
Networks	
D6603	UMTS HSPA+ 850 (Band V), 900 (Band VIII), 1700 (Band IV), 1900 (Band II), 2100 (Band I) MHz GSM GPRS/EDGE 850, 900, 1800, 1900 MHz LTE (Bands 1, 2, 3, 4, 5, 7, 8, 13, 17, 20)
D6633	UMTS HSPA+ 850 (Band V), 900 (Band VIII), 1700 (Band IV), 1900 (Band II), 2100 (Band I) MHz GSM GPRS/EDGE 850, 900, 1800, 1900 MHz LTE (Bands 1, 2, 3, 4, 5, 7, 8, 17, 20)
D6643	UMTS HSPA+ 850 (Band V), 900 (Band VIII), 1700 (Band IV), 1900 (Band II), 2100 (Band I) MHz GSM GPRS/EDGE 850, 900, 1800, 1900 MHz LTE (Bands 1, 2, 3, 4, 5, 7, 8, 17, 20)

D6653	UMTS HSPA+ 850 (Band V), 900 (Band VIII), 1900 (Band II), 2100 (Band I) MHz GSM GPRS/EDGE 850, 900, 1800, 1900 MHz TD-LTE (Band 40) FD-LTE (Bands 1, 3, 5, 7, 8, 28)
D6683	UMTS HSPA+ 850 (Band V), 900 (Band VIII), 1900 (Band II), 2100 (Band I) MHz GSM GPRS/EDGE 850, 900, 1800, 1900 MHz TD-LTE (Band 38, 39, 40, 41) FD-LTE (Bands 1, 3, 7)
D6616/D6646	UMTS HSPA+ 850 (Band V), 900 (Band VIII), 1700 (Band IV), 1900 (Band II), 2100 (Band I) MHz GSM GPRS/EDGE 850, 900, 1800, 1900 MHz LTE (Bands 2, 4, 12)
Data transfer speeds	
GSM GPRS	Up to 107 kbps
GSM EDGE	Up to 296 kbps
HSUPA (upload)	Cat 6, up to 5.8 Mbps
HSDPA (download)	Cat 24, up to 42 Mbps
LTE (upload)	Cat 4, up to 50 Mbps
LTE (download)	Cat 4, up to 150 Mbps
Battery performance	
Talk time (GSM)	Up to 14 hours***
Standby time (GSM)	Up to 890 hours***
Standby time (GSM+GSM)	D6633 Up to 510 hours***
Standby time (GSM+WCDMA)	D6633 Up to 480 hours***
Standby time (GSM+LTE)	D6633 Up to 540 hours***
Talk time (UMTS)	Up to 16 hours***
Standby time (UMTS)	Up to 920 hours***
Standby time (LTE)	Up to 800 hours***
Music listening time	Up to 130 hours***
Video playback time	Up to 10 hours***
Battery (Embedded)	3100 mAh minimum

** For the D6643/D6653 models, memory comprises approximately 2.8 GB of firmware, plus 11.8 GB of "Internal storage" for music, pictures and movies, and downloaded applications and their data. For the D6603/D6633 model, memory comprises approximately 2.8 GB of firmware, plus 11.6 GB of "Internal stor-*

age" for music, pictures and movies, and downloaded applications and their data. For the D6616/D6646 model, memory comprises approximately 2.8 GB of firmware, plus 26 GB of "Internal storage" for music, pictures and movies, and
downloaded applications and their data. For more details about memory, see "Memory in Android™ devices" on page 22.

*** The D6643 model does not support this feature.*

**** Values are according to GSM Association Battery Life Measurement Technique as performed in controlled laboratory conditions. Actual time may vary. The standby times given are for the D6633 model with two SIM cards inserted and tested in different network modes/combinations.*

NOTE: The battery performance may vary depending on network conditions and configurations, and device usage.

NOTE: The performance metrics are all measured under laboratory conditions.

Categorised feature list

Camera

20.7 MP camera with Sony Exmor RS™ for mobile image sensor
25 mm wide-angle
8x digital zoom
AR Effect
Auto focus
Background Defocus
Burst mode
Creative effects
HDR for photos and movies
Face detection
Face in
Flash/Pulsed LED
Flash/Photo light
Front-facing camera (2.2 MP 1080p) with Sony Exmor R™ for mobile image sensor
Geotagging
Image stabiliser
Live on YouTube™
Multi-camera
Object tracking
Quick Launch
Red-eye reduction
Scene recognition
Self-timer
Send to web
Sequential video recording
Smile Shutter™
Sound Photo
SteadyShot™
Superior Auto
Sweep Panorama
Timeshift burst
Timeshift video
Touch capture
Touch focus
Video recording (4K)
Vine*
White balance

Music

3D Surround Sound (VPT)
Bluetooth® stereo (aptX®, A2DP)
ClearAudio+
Clear Bass™
Dynamic normaliser
Hi-Res audio via 3.5mm audio jack and USB
Hi-res audio (LPCM, FLAC, ALAC, DSD)
Low power audio playback***
Music tones (MP3/AAC)
S-Force Front surround
Stereo speakers
TrackID™ music recognition*
Music application

Internet

Bookmarks
Google Chrome™*
Google Play™*
Google™ search*
Google Voice™ Search*
Google Maps™ for Mobile with Street view*
Info-eye™*
Pan & zoom
Web browser*
What's new
Xperia™ Lounge*

Communication

Answering machine*
Call list
Enriched calling
Google+*
Hangouts™*
Noise suppression
Polyphonic ringtones
Slow talk
Smart call handling
Speakerphone
Talk equaliser
Voice enhancement
Xperia™ Socialife*

Messaging

Conversations
Email
Google Mail™*
Handwriting recognition
Instant messaging
Multimedia messaging (MMS)
Predictive text input
Sound recorder
Text messaging (SMS)

Design/Other features

Auto rotation
Bluetooth® unlock
Direct touch
Doze & App standby
Face Unlock
Gesture input
IPX5 and IPX8 (water resistant)**
IP6X (Dust tight)
Live Color LED
On-screen QWERTY keyboard
Screenshot capturing
Screen video recording
Small Apps
Smart backlight control
Smart screen rotation
Super-vivid mode
Throw
Xperia™ Home
X-Reality™ for mobile
Touch screen
TRILUMINOS™ Display for mobile
Voice input
Wallpaper

Entertainment

3D games
Digital TV (1seg)*
Lifelog
Media browser
Motion gaming
Movie creator
Radio (FM radio with RDS)*
Reader mode*
SensMe™ slideshow
Sony Entertainment Network*
Video streaming
YouTube™*

Organiser

Airplane mode
Alarm clock
Calculator
Calendar
Contacts
Document readers/editors
eCompass™
Setup guide
Sketch
Stopwatch
Timer

Connectivity

3.5 mm audio jack Digital Noise Cancelling (DNC)
ANT+™ sport, fitness, health support
aGPS*
BeiDou
Bluetooth® 4.1 wireless technology
Cast screen
Charging Dock Connector Device Connection
DLNA Certified®
GLONASS
HDCP
MHL 3.0 support + 5-pin support
Media Transfer Protocol support
Micro USB support
MirrorLink
Native USB tethering
NFC
Xperia™ Companion
Screen mirroring
Synchronisation via Facebook™
Synchronisation via Google™*
Synchronisation via SyncML™
Synchronisation via Exchange ActiveSync®
USB Connection mode
USB Charging
USB High speed 2.0 support
USB Host
Wi-Fi®
Wi-Fi® Hotspot functionality
Wi-Fi CERTIFIED Miracast®
Xperia Link™

** This service is not available in all markets. Digital TV is only available for the D6643 model.*

*** The Xperia™ Z3 is water resistant and protected against dust, so don't worry if you get caught in the rain or want to wash off dirt under a tap water, but remember all ports and attached covers should be firmly closed. You should not put the device completely underwater; or expose it to seawater, salt water, chlorinated water or liquids such as drinks. Abuse and improper use of device will invalidate warranty. The device has been tester under Ingress Protection rating IP65/IP68.*

**** This feature is only available when you play music using the Music application.*

Technologies in detail

NOTE: The information outlined below is general and levels of compliance to standards and specifications may vary between products and markets. For more information, contact Sony Mobile Developer World or your Sony contact person where applicable.

Accessibility and Usability

Talkback*	Yes
Captions*	Yes
Magnifications gestures*	Yes
Large Text*	Yes
High Contrast Text*	No
Power button ends call*	Yes
Auto-rotation*	Yes
Speak Passwords*	Yes
Accessibility Shortcuts*	Yes
Text – to – Speech*	Yes
Touch and hold delay*	Yes
Color Inversion*	No
Color correction*	No
Hearing Aid Compatibility (HAC)	Yes
Teletypewriter (TTY)**	Yes

** Android Lollipop feature. Subject to possible change in future releases of Google™ Android™.*

*** The TTY feature is for deaf or hearing-impaired users.*

Device-to-device communications (local)

ANT+™ wireless technology

Connectable devices	ANT+™ devices require the download of a supporting application
Frequency band	2.4 GHz
Data transfer rate	Up to 60 Kbps
Encryption	AES-128
Topologies	One to Many, Many to One, Peer to Peer, Star, Practical Mesh

Bluetooth® wireless technology

Bluetooth® profiles supported	Advanced Audio Distribution Profile v1.2 Audio/Video Remote Control Profile v1.3 Device Identification Profile v1.3 Generic Attribute Profile Client/Server over LE Handsfree Profile v1.7 (Wide band speech) Headset Profile v1.2 HID over GATT Profile v1.0 Human Interface Device Profile, Host role v1.0 Messaging Access Profile v1.2 Object Push Profile v1.2 Personal Area Networking Profile v1.0 Phonebook Access Profile v1.1 Serial Port Profile v1.2
Core version and supported core features	Version 4.1 Bluetooth Low Energy
Other supported features	aptX® CD quality audio streaming over Bluetooth® connection
Connectable devices	Products that support at least one of the Bluetooth® profiles listed above. Bluetooth® 4.1 accessories generally require the installation of a supporting application.

More information:

www.sonymobile.com/developer

www.bluetooth.com

Wi-Fi®

Supported standards	IEEE 802.11a/b/g/n/ac and Wi-Fi® Wi-Fi Direct®, Wi-Fi Protected Setup™, Wi-Fi CERTIFIED Passpoint™, Wi-Fi CERTIFIED Miracast®
Connectable devices	Wi-Fi® access points Wi-Fi Direct® compatible devices
Frequency band	2.4 GHz/5 GHz
Data transfer rate	Up to 433 Mbit/s
Security	Open Authentication Shared Authentication EAP-SIM EAP-AKA EAP-AKA' EAP-TLS EAP-TTLS/MSCHAPv2 PEAPv0/EAP-MSCHAPv2 PEAPv1/EAP-GTC WPA Personal and WPA2 Personal WPA Enterprise and WPA2 Enterprise
Encryption	WEP 64 bit, WEP 128 bit, TKIP and CCMP (AES)
Power save	WMM®-UAPSD
QoS	WMM® WMM® Power Save

DLNA Certified® (Digital Living Network Alliance)

Supported Device Classes	***M-DMS – Mobile Digital Media Server*** Media Types: image, video and music Summary: The digital media server exposes the media files in your device to a Wi-Fi® network. The files can then be accessed from other DLNA Certified® clients. ***M-DMP – Mobile Digital Media Player*** Media Types: image, video and music Summary: Play content stored on another device, for example, a server or a PC, directly on your device. ***M-DMC – Mobile Digital Media Controller*** Media Types: image, video and music Summary: A remote controller that locates media files and plays them on your device. ***+PU+*** Media Types: image, video and music Summary: Play media in your device on another device, such as a TV or a PC using 2 box push technology. +PU+ is integrated in the Album, Movies and Music applications. ***+DN+*** Media Types: image, video and music Summary: Download content stored on another device, for example, a server or a PC, and play the downloaded content directly on your device. ***+UDO+*** Media Types: image, video and music Summary: The digital media server also has the capability to get uploaded files from other DLNA Certified® clients.
Supported Bearers	Wi-Fi® Wi-Fi Direct®
DRM Support	The DLNA Certified® implementation does not support DRM-protected content.

Messaging

MMS (Multimedia Messaging Service)

According to OMA Multimedia Messaging Service v1.0 + SMIL

Email

Bearer type (IP)	GPRS, EGPRS, UMTS, LTE, Wi-Fi®
Character sets	BIG5 Traditional Chinese GB18030 ISO-2022-JP Japanese ISO-8859-1 ISO-8859-2 Eastern Europe ISO-8859-5 Cyrillic ISO-8859-7 Greek ISO-8859-9 Turkish ISO 8859-11 KOI8-R Cyrillic Shift_JIS Japanese US-ASCII UTF-16 UTF-8 Windows® 874 Windows® 1251 Cyrillic Windows® 1252 Windows® 1254 Turkish Windows® 1258 Vietnamese
Protocols	POP3 and IMAP4
Push email	Microsoft® Exchange ActiveSync® (EAS) IMAP4 IDLE (RFC2177)
Secure email	SSL/TLS, both port methods (POPS/IMAPS) and STARTTLS
HTML mail	Yes (read only)

More information:

www.sonymobile.com/developer

www.openmobilealliance.org

Positioning – location based services

Supported standards:

- OMA Secure User Plane Location (SUPL) v1.0 and v2.0
- 3GPP™ Control Plane location (incl. Emergency location)
- Qualcomm® GPSOneXtra™

Supported satellite systems:

- GPS
- GLONASS
- BeiDou

NOTE*:* GPS, GLONASS and BeiDou are used together to calculate the position. Positioning is available at more locations and more accurate if all three systems are used. The benefits of using GLONASS and BeiDou are automatically available for all applications using the positioning APIs.

Provisioning (OMA CP)

OMA CP version 1.1

Multimedia (audio, image and video)

Audio Playback	**Decoder format**	**Supported file format**
	AAC-LC	MP4(.mp4), M4V(.m4v), 3GPP(.3gp, .3gpp), MPEG-2 TS(.ts, .m2ts, .tts), AVI(.avi), ADTS(.aac), M4A(.m4a)
	AAC+	MP4(.mp4), 3GPP(.3gp, .3gpp), MPEG-2 TS(.ts, .m2ts, .tts), AVI(.avi), ADTS(.aac)
	eAAC+	MP4(.mp4), 3GPP(.3gp, .3gpp), MPEG-2 TS(.ts, .m2ts, .tts), AVI(.avi), ADTS(.aac)
	AAC-ELD	MP4(.mp4), 3GPP(.3gp, .3gpp)
	ALAC	M4A(.m4a)
	AMR-NB	3GPP(.3gp, .3gpp), AMR(.amr)
	AMR-WB	3GPP(.3gp, .3gpp), AWB(.awb)
	DSD	DSF(.dsf), DSDIFF(.dff)
	FLAC	Matroska(.mkv), FLAC(.flac), MatroskaAudio(.mka)
	MIDI	SMF(.mid), XMF(.xmf), Mobile XMF(.mxmf), RTTTL(.rtttl), RTX(.rtx), OTA(.ota), iMelody(.imy)
	MP3	MP3(.mp3)
	PCM	AVI(.avi), Matroska(.mkv), MatroskaAudio(.mka), WAVE(.wav), AIFF(.aiff, .aif, .aifc)
	Opus	Matroska(.mkv), WebM(.webm), MatroskaAudio(.mka)
	Vorbis	Matroska(.mkv), WebM(.webm), MatroskaAudio(.mka), Ogg(.ogg)
	WMA	ASF(.wma)
Audio Recording	**Encoder format**	**Supported file format**
	AAC-LC	MP4(.mp4), ADTS(.aac)
	AAC+	MP4(.mp4)
	AAC-ELD	MP4(.mp4)
	AMR-NB	3GPP(.3gp), AMR(.amr)
	AMR-WB	3GPP(.3gp), AWB(.awb)

Image Playback	**Decoder format**	**Supported file format**
	BMP	BMP (.bmp)
	GIF	GIF (.gif)
	JPEG	JPEG (.jpg, .jpeg)
	PNG	PNG (.png)
	WebP	WebP (.webp)
Image Capture	**Encoder format**	**Supported file format**
	JPEG	JPEG (.jpg)
	PNG	PNG(.png)
	WebP	WebP(.webp)
Video Playback	**Decoder format**	**Supported file format**
	MPEG-4 Video	MP4(.mp4), M4V(.m4v), 3GPP(.3gp, .3gpp)
	H.263	MP4(.mp4), 3GPP(.3gp, .3gpp)
	H.264	MP4(.mp4), M4V(.m4v), 3GPP(.3gp, .3gpp), MPEG-2 TS(.ts, .m2ts, .tts), AVI(.avi), Matroska(.mkv)
	H.265	MP4(.mp4), Matroska(.mkv)
	VP8	Matroska(.mkv), WebM(.webm)
	VP9	Matroska(.mkv), WebM(.webm)
	Xvid	AVI(.avi)
Video Recording	**Encoder format**	**Supported file format**
	MPEG-4	MP4(.mp4), 3GPP(.3gp)
	H.263	MP4(.mp4), 3GPP(.3gp)
	H.264	MP4(.mp4), 3GPP(.3gp)
	H.265*	MP4(.mp4)
	VP8	WebM(.webm)
Audio/Video Streaming	Streaming transport	HLS HTTP progressive streaming RTSP
DRM	DRM (Digital Rights Management) – Supports DRM-protected down-loaded content	OMA OMA DRM v1.0 Marlin DRM Widevine Level 1 PlayReady DRM (available in specific regions)

Digital TV (1seg)

Data Broadcasting	Supported
Recording	Supported
Viewing reservation	Supported
Recording reservation	Supported

NOTE: The Digital TV service is only available for the D6643 model.

Synchronisation (OMA DS, EAS, Google Sync™)

OMA Data Synchronisation protocol versions 1.1.2 and 1.2

OMA Data Formats: vCard 2.1, vCalendar 1.0

Microsoft® Exchange ActiveSync® protocol version 2.5

Microsoft® Exchange ActiveSync® protocol version 12

Microsoft® Exchange ActiveSync® protocol version 12.1

Microsoft® Exchange ActiveSync® protocol version 14

Microsoft® Exchange ActiveSync® protocol version 14.1

Google Sync™

Related information:

www.sonymobile.com/developer

Web browser

Google Chrome™ for Android™ is pre-installed in markets/regions where no restrictions apply.

Related information:

https://play.google.com/store/apps/details?id=com.android.chrome

Memory in Android™ devices

To use Android devices efficiently, users should be aware of the different types of device memory. This knowledge is important in order to understand, for example, where music, photos and videos are saved; how many apps can be downloaded from Google Play™; and how photos can be copied to a PC.

The below information is also of interest to developers who want to optimise their programs to make the best possible use of the resources in the device.

Generally, all Android devices share the same basic memory setup. What differs is how much memory is available to you via the different types of memory, and whether your device uses an external SD card or an internal memory chip. Any information specific to the particular device model described in this White Paper is noted as such.

Types of memory

The types of memory described and numbered below are consistent with the terminology used in Sony mobile device menus and in other content relating to 2014 Xperia™ devices:

1. **Dynamic Memory** (also known as RAM) is used by applications that run when the device is turned on. The amount of Dynamic Memory influences how many applications and operating system services can run at the same time. The Android operating system automatically closes applications and services that are not being used.

   However, such automatic functionality has limits. For example, if a lower amount of free RAM is available to applications after a new release of the operating system (due to increased capabilities in the system), device speed will eventually be impacted. This is the main reason that a device cannot be indefinitely upgraded to newer releases of Android™.

   If you experience problems with RAM, for example, if the device runs slower than usual or if the Home application restarts frequently when you leave an application, you should minimise the use of apps that run all the time. Such apps could include, for example, applications that frequently download social networking service updates. You could also consider using a static wallpaper instead of a live wallpaper.

   To see which apps and services are currently active, go to **Settings > Apps > Running**. You should have at least 50 MB, and ideally 100 MB or more, of free RAM to avoid slowdowns and application restarts.

   You should also be aware that if you update the device to a later Android release, the load on the built-in Dynamic Memory will increase due to the addition of more features, as mentioned above. As a result, the device may run slower after an update.

   The Xperia™ Z3 has about 3 GB of RAM available to the Android OS and applications, of which about 200 MB is already used out of the box.

2. **System Memory** (also known as “System partition” or “/system”) is used for the Android OS and for most applications that are pre-loaded from the factory. This type of memory is normally locked, and can only be changed through a firmware upgrade. There is usually some free space available in this section of memory. However, since it is locked, you cannot save apps, photos or any other content to this memory. System Memory is reserved for future firmware upgrades, which almost always need more memory than the original firmware. You cannot see or influence the use of this memory.

3. **Internal Storage** is memory used as” working” memory. It can be compared to the C: drive on a PC or to the startup disk on a Mac.

This type of memory is used to store all application downloaded from the Google Play™ Store (and other sources) as well as their settings and data (such as emails, messages and calendar events, for example). All applications have an allocated area which no other applications can access and where the application data can be stored.

Some game applications also store content such as game music and game level information outside their own designated area. In most cases, an application can choose to save its data in a location of its own choosing (outside the protected application settings area). Generally, such content is not deleted when an application is uninstalled; it must be removed manually by connecting the device to a computer with a USB cable, or by using a file manager application.

Internal Storage is also used for all user content added, for example, as a result of the user taking photos with the camera, downloading media files, and performing file transfers. Typical user content includes:

- photos
- movies
- music
- downloaded documents (as email attachments, for example)

Internal Storage will tend to fill up as a result of normal usage. Examples of such usage are the saving of data by applications; the downloading and installation of new applications; the downloading of free or paid content; and the shooting of pictures and movies. Therefore, the larger this memory is from the start, the more applications you can download and use, and the more pictures and movies you can shoot.

If the Internal Storage starts to get full, the device slows down, and in some cases it might no longer be possible to install more apps. You should always ensure that you have at least 100 MB of free Internal Storage. If not, you should consider removing some apps that you seldom use, or move content that you do not frequently access to safe storage.

You can see approximately how much Internal Storage is free in **Settings** > **Storage** > **Internal Storage**. (when you insert an SD-Card) or **Settings** > **Storage** (if you do not insert an SD-Card) You can also view more detail about how much memory is used by applications in **Settings** > **Apps**. For the Xperia™ Z3, about 12 GB of Internal Storage is available out of the box for the D6643, D6653, D6633 and D6603 variants. About 26 GB of Internal Storage is available out of the box for the D6616/ D6646 variant.

Please note that in Sony Mobile 2014 products, “Internal Storage” is now the combination of what was previously known as “Device Memory” or “Phone Memory” (for applications and their data – also previously known as “/data”) and “Internal Storage” (for user’s content – also previously known as “/ sdcard”). The reason for this change is to make the use of available memory more flexible, and also to enable the optional encryption of user’s content.

Memory card slot

In some products you may find both a large internal memory and a memory card reader slot. However, on the current Android platform, the card reader slot does not work in the same manner in a device with a large internal memory as it does in a device with ONLY a memory card slot.

Generally, since most applications expect only a single location for storage, such applications will not generally allow you to SAVE anything to the memory card (i.e., they do not offer the option to choose a storage location). However, some applications (for instance, the Sony Mobile “Camera” application) may actually allow you to do so. Other applications, for example, backup applications such as the Sony Mobile “Memory” application, will by definition be configured to copy content from the Internal Storage to the external SD card.

On the other hand, when it comes to reading from an external SD Card, you will be able to access content (for example, videos, photos and music) on a memory card inserted in this slot without any special consideration since the Android system searches all available memory for content. Therefore, such products may be regarded as supporting a fourth type of memory, called “External Card” or “SD Card”.

4. **SD Card** (known as “/sdcard1” from a programmer’s point of view, or by other names in other Android products) is the name for the removable SD memory card in all 2014 Sony Mobile products. As described above, this External Card memory is generally more limited in that any application can read from it, but many applications cannot save to this card. Only a few applications, including backup applications and file manger applications, have the capability to save to this card.

Backing up data to different memory types
Generally, you should not save photos, videos and other personal content solely on the internal memory of a device. If something should happen with the hardware, or if the device is lost or stolen, the data stored on the device’s internal memory is gone forever.

In a device where an SD card reader is the main memory, it is relatively easy to take the card out and copy all content to a PC or Mac, or to an entertainment device with a memory card slot. In a product featuring Internal Storage as the main memory, it is not possible to physically remove the memory. Instead, any critical or high-value content must either be copied to an external SD card by a special backup application, transferred to remote storage over a network (mobile or Wi-Fi), or to a computer via a USB cable.

To facilitate the transfer of data via a cable, the Xperia™ Z3 supports the Microsoft standard, Media Transfer Protocol (MTP), which makes it possible to easily transfer content back and forth between your device and a Windows® PC or an Apple™ Mac® computer. This application is called Xperia™ Companion and can be downloaded from the Xperia™ Z3 support page.

Note that you do not need to back up or make a copy of applications that you have downloaded from the Google Play™ Store. They can normally be downloaded again after you have set up your Google account to work in a new device (or in a device where the memory has been completely erased).

Note 1:
As noted above, some Android devices, including Sony Mobile devices from 2012 and Sony Ericsson devices from 2011 and earlier, do not use a single “Internal Storage” for both applications (and their data) and user content. Instead, these devices use either an external SD card for user content, or a corresponding area of internal memory to reproduce the functionality of an SD card. In such devices, there is a fixed limit between the application area (“/data”) and the user content area (“/sdcard”), with the result that user content can build up and reach this limit. The consequence of such a limit being reached, for example, for the camera application, would be that no new pictures could be taken even if there was still a considerable amount of free space in the application area (or in the user content area). In such an instance, the download and installation of new applications would also not be possible, even if there was enough free memory in the content area.

Note 2:
Some devices with integrated storage have abandoned the distinction between the application area and the content area when it comes to a Factory Data Reset. As a result, there is no option in such devices to perform a Factory Data Reset and preserve content. In such devices, all content is mandatorily and completely deleted from the device when a reset is performed.

In contrast, Sony Mobile’s memory integration solution makes it possible to preserve user content in this situation. Therefore, when performing a Factory Data Reset, the default action will still be to only remove applications and their data, and an option box must be checked if all content is to be removed as well (as might be desirable when selling the device second-hand, for instance).

Note 3:
For a developer, it is important to note that from a programming point of view the location names used to refer to the different memory areas described in Note 1 are still valid, i.e., the area used for applications ("/data") is still present, as is the area used for content ("/sdcard").

In reality, "sdcard" is a so-called "symbolic link" to "/data/media". However, from inside an Android application, "/sdcard" can still be used. For example, you can use "sdcard/DCIM/100Android" to find all camera images. The continued use of "/sdcard" to access the content area ensures compatibility across different products and Android releases in this regard.

Trademarks and acknowledgements

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